DELTA SMELT

Delta smelt were analyzed using salvage numbers. This was used as a rough indicator of effects on populations. A population-level analysis of effects on smelt is not possible at this time.

Adult smelt salvage was reduced in the gaming. Actions primarily focused upon were export reductions and increases or decreases (to back water up) in delta outflow, typically in the January through March period. These protections often coincided with salmon presence; thus at many times both species benefitted from the same actions. Games 4 and 5 provided the largest reduction in salvage (40 and 37%, respectively). On the average, prescriptive standards provided slightly better reduction (30%) in adult smelt salvage, but the gaming exercises were also effective in reducing salvage (27%) from historical levels.

Smelt juveniles, typically present in April through July, benefitted from the gaming in most years of most games. Actions to protect smelt juveniles include export reductions and San Joaquin-side inflow increases before and after the VAMP period. However, salvage was often at higher levels than those recorded historically. Overall the gaming exercises increased smelt salvage by 3%. Values for each game ranged from a salavge increase of 19% for game 1 to a decrease of 23% for game 2. The prescriptive standards were much more effective in reducing salvage, averaging a 54% reduction for the four-year period.

(Note: there is disagreement among the DNCT on the importance of gaming results as compared to historic salvage. Water user biologists claim that historic numbers should not be used for comparison, and that the degree of benefit from EWA actions as compared to base is the fundamental issue. Resource agency biologists dispute the point because the intent of the EWA should be to protect fish better than they were in the early 1990s. **This parenthetical item may be better discussed somewhere else in the document)**

For several years and games, we made the assumption that actions taken prior to VAMP (increased flows, reduced exports, and improved X2) would result in less juvenile delta smelt in the influence of the pumps than if those actions had not been taken. Consequently, we allowed pumping at higher levels than strict interpretation of the salvage data would have permitted. If we assumed correctly that fish densities would have been less after the VAMP period, gaming results would have actually provided greater protection for juvenile delta smelt than are indicated by our results. If the fish remained in areas under influence of the pumps (as they did in 1999), significantly more water would have been necessary to provide adequate protections.

Although the prescriptive standards were generally more protective overall than the gaming exercises, it appears that the EWA with sufficient assets has the potential to provide substantial benefits to delta smelt. EWA assets particularly needed for smelt are (a) the ability to reduce exports in the Jan-Mar period for adult fish, and in the April-June period for juveniles, and (b) the ability to provide inflows from the San Joaquin side of the Delta during the same time period.

SPLITTAIL

Gaming exercises proved also to be protective of splittail. The primary measures used in EWA gaming to protect splittail were reduction of exports and increase in outflow during the spring/early summer period. Most actions to protect splittail were taken concurrent with actions for delta smelt young. However, in all the games we provided protections specifically for splittail by reducing exports in 1995, when historically over 4 million fish were salvaged at the pumps. In this critical year for splittail, gaming results show that salvage was at least reduced to level which matched the historic level. On the average, gaming exercises reduced salavge by 34%, while the prescriptive standards provided a 61% reduction.